AMENDMENTS TO THE SPECIFICATION

Please replace the paragraph beginning at page 1, line 5 with the following rewritten paragraph:

a1 The present invention relates to a computer color-matching apparatus and a paint color-matching method using the apparatus.

Please replace the paragraph beginning at page 1, line 9 with the following rewritten paragraph:

a2 A color-matching system using a computer is publicly known because it is disclosed in the specification of U.S. ~~US~~ Patent No. 3,601,589. The above-identified U.S. ~~above UP~~ Patent discloses a method in which the total spectrum reflectance of an unknown color panel is decided by a spectrophotometer, the reflectance is sent to a computer, and the computer mathematically processes the previously-stored data showing the K-value (showing "light absorbing coefficient") and S-value (showing "light scattering coefficient") of a pigment and performs logical color-matching.

Please replace the paragraph beginning at page 1, line 18 with the following rewritten paragraph:

a3 The contents disclosed in the ~~above UP~~ above-identified U.S. Patent relates a set of calculation procedures. That is, according to the calculation procedures, it is possible to calculate the K-value and S-value of a set of wavelengths and moreover, decide a set of pigments so that the K-value and S-value of the pigments become equal to the K- and S-values of an unknown color for each wavelength of the wavelength set. This is a basic color-matching algorithm also used for other spectrophotometric color-matching systems.

Please replace the paragraph beginning at page 1, line 26 with the following rewritten paragraph:

The system according to the ~~above US~~ above-identified U.S. Patent has problems in that, first~~firstly~~, the system is very expensive and it is difficult to maintain the system, and second~~secondly~~, the system performs logical color-matching using the data obtained from unknown and already-known pigments of unknown colors. That is, a final color obtained by mixing pigments in accordance with a calculated color value may become a color different from the above unknown color. Therefore, the above color-matching formula is usually a primary mathematical approximation method and therefore, it is necessary to correct and adjust the system by correcting the software that is a part of the system.

Please replace the paragraph beginning at page 2, line 5 with the following rewritten paragraph:

To improve the ~~above~~ above-described system, Japanese Patent Laid-Open No. 153677/1988 discloses a method and an apparatus of analyzing a selected color by using a portable color meter, storing the color data showing the hue, chroma, and brightness, connecting the color data in the color meter to a computer, storing a plurality of usable color formulas (paint blending) in the computer, storing the color data showing the hue, chroma, and value (brightness) of each paint designated by the stored usable color formulas in the computer, comparing the color data of the selected color received from the color meter with the stored color data showing the stored usable color formulas to find the best approximation matching, selecting a stored color formula shown by the color data found as the best approximation matching, and thereby color-matching the selected color.

Please replace the paragraph beginning at page 3, line 20 with the following rewritten paragraph:

Furthermore, the present invention provides a computer color-matching method for executing the following steps (1) to (3) by using a computer color-matching apparatus constituted of (A) a colorimeter, (B) a micro-brilliance-feeling measuring device, and (C) a computer in which a plurality of paint blends, color data and micro-brilliance-feeling data corresponding to

each of the paint blends, color characteristic data and micro-brilliance-feeling data for a plurality of full color paints are entered, and a color-matching-calculation logic using the paint blends and the data operates to execute:

Please replace the paragraph beginning at page 4, line 20 with the following rewritten paragraph:

Furthermore, the present invention executes the following steps (5) to (7) by using a computer color-matching apparatus constituted of (A) a colorimeter, (B) a micro-brilliance-feeling measuring device, and (C) a computer in which a plurality of color numbers, paint blends corresponding to the color numbers, color data and micro-brilliance-feeling data corresponding to the color blends, and color characteristic data and micro-brilliance-feeling ~~characteristic~~ data of a plurality of full color paints and a color-matching-calculation logic using the paint blends and the data operates to execute:

Please replace the paragraph beginning at page 6, line 17 with the following rewritten paragraph:

A computer color-matching apparatus of the present invention comprises ~~the following~~ a colorimeter (A), a micro-brilliance-feeling measuring device (B), and a computer (C).

Please replace the paragraph beginning at page 6, line 25 with the following rewritten paragraph:

A multiangle colorimeter whose measuring angle is multiangle is preferable as the above colorimeter. The multiangle colorimeter measures colors under two angle conditions or more, normally two to four angle conditions, that is, two or more conditions in which light incident angles are different from each ~~another~~ other or light-receiving angles are different from each ~~another~~ other. The light-receiving angle is ~~a~~an angle formed between a mirror-reflection axis and a light-receiving axis. The mirror-reflection axis denotes an axis for forming a reflection angle

a9

cont'd when an incident angle is equal to the reflection angle, that is, an axis in which a reflection angle is 45° when an incident angle is 45°.

Please replace the paragraph beginning at page 7, line 5 with the following rewritten paragraph:

a10

To change light-receiving angles, light-receiving-angle conditions are not restricted. It is preferable that the light-receiving angles are kept at one of 15° to 30° and one of 75° to 110° when two angle ~~condition is~~ conditions are used, the light-receiving angles are kept at one of 15° to 30°, one of 35° to 60°, and one of 75° to 110° when three angle ~~condition is~~ conditions are used, and the light-receiving angles are kept at one of 15° to 30°, one of 35° to 60°, one of 70° to 80°, and one of 90° to 110° when four angle ~~condition is~~ conditions are used, because it is easy to correspond to visual color determination.

Please replace the paragraph beginning at page 8, line 7 with the following rewritten paragraph:

a11

To measure the micro-brilliance feeling of a brilliant paint film by the above micro-brilliance-feeling measuring device, light is first irradiated to a brilliant paint film surface. It is preferable to use dummy (artificial) sunlight as the above light and a halogen lamp or metal-halide lamp is suitable for the light source of the dummy sunlight. A light irradiation angle to the brilliant paint film surface normally uses 5° to 60° in accordance with the plumb line of a paint surface, preferably uses a range of 10° to 20°, and most preferably uses approximately 15° from the plumb line. Moreover, though the shape of a light irradiation area is not restricted, it is generally circular. It is preferable to set a light irradiation area on a paint film surface to a range of 1 to 10,000 mm^2 but the area is not restricted to ~~the~~ this range. It is preferable to set the illuminance of irradiation light in a range of 100 to 2,000 lux.

Please replace the paragraph beginning at page 9, line 15 with the following rewritten paragraph:

In the case of a two-dimensional image photographed by the above CCD camera, a partition of the image corresponding to a portion having a strong reflection light of a brilliant pigment has a high brightness because the portion has a strong glitter feeling and a partition corresponding to a portion having a weak reflection light of the pigment naturally has a low brightness. Moreover, even in the case of a partition corresponding to a portion having a strong reflection light of a brilliant pigment, the brightness changes depending on the size, shape, angle, or material of the pigment. That is, the present invention makes it possible to display the brightness for each partition and three-dimensionally display the brightness distribution of a two-dimensional image photographed by a CCD camera in accordance with the brightness of each partition. The three-dimensional brightness distribution map is divided into crest, trough, and flat portions, in which the height or size of a crest shows a brilliance-feeling degree of a brilliant pigment.~~, it is shown that a~~ A brilliance feeling becomes more remarkable as the crest becomes higher, and trough and flat portions show that there is no brilliance feeling or there is a weak brilliance feeling and mainly show reflection of light by a coloring pigment or substrate.

Please replace the paragraph beginning at page 10, line 19 with the following rewritten paragraph:

A two-dimensional image obtained by photographing a brilliant paint film surface irradiated with light by a CCD camera is divided into a lot of partitions, the total sum is obtained by totaling brightnesses of all partitions, an average brightness x is obtained by dividing the total sum by the total number of partitions, and a threshold α [[(]] is set to a value of the average brightness x or more. It is generally proper that the threshold α is the sum of the average brightness x and y (y is generally set to a value between 24 and 40,~~ preferable~~ preferably set to a value between 28 and 36, and more preferably~~ to~~ set to 32).

Please replace the paragraph beginning at page 11, line 13 with the following rewritten paragraph:

Moreover, a threshold ß is set which is the average brightness x or more but the threshold α or less. It is proper that the threshold ß is equal to or less than the threshold α and equal to the sum of the average brightness x and z (z is generally set to a value between 16 and 32, preferably set to a value between 20 and 28, and more preferably ~~to~~ set to 24).

Please replace the paragraph beginning at page 16, line 18 with the following rewritten paragraph:

The above color number entered in a computer according to necessity is generally a color code number designated for each painted product maker and a paint blend for refinish paint in accordance with the color number is entered in the computer. The paint blend can be only one or only one set for one color number. However, a past-record blend can ~~be~~ also be included and it is permitted that a plurality of blends or a plurality of sets of blends are entered. The color-measurement data of the formed paint film obtained from a multiangle colorimeter is previously entered in the computer.

Please replace the paragraph beginning at page 17, line 8 with the following rewritten paragraph:

Step~~The step~~ (1) is a step of measuring a paint film of a reference color to which a paint color should be adjusted through color-matching by the colorimeter (A) and obtaining the color data of the reference color.

Please replace the paragraph beginning at page 17, line 23 with the following rewritten paragraph:

Step~~The step~~ (2) is a step of measuring a paint film of the above reference color by the micro-brilliance-feeling measuring device (B) and obtaining the micro-brilliance-feeling data of the reference color.

Please replace the paragraph beginning at page 20, line 15 with the following rewritten paragraph:

In the case of the first and second color-matching methods, it is possible to transfer a paint blend to an electronic balance through a telephone line or optical cable. It is possible to obtain a color-matched paint by blending through an electronic balance in accordance with the transferred blend. A color-matched painted plate is obtained by painting the color-matched paint to a substrate, it is possible to determine whether the paint is acceptable. When the ~~pain~~paint is unacceptable, it is possible to obtain a corrected blend again by operating a color-matching-calculation logic in accordance with the paint blend of the color-matched paint and the color data and micro-brilliance-feeling data of the color-matched painted plate.

Please replace the paragraph beginning at page 24, line 27 with the following rewritten paragraph:

The paint color of the color-matched painted plate based on the "SM-001CK01" was not accepted because it was slightly ~~separate~~different from the reference color. However, the micro-brilliance-feeling index showed a value almost equal to the case of the reference color and the micro-brilliance feeling of aluminum powder serving as a brilliant material was matched through visual observation. The paint color of a color-matched painted plate based on the "SM-001CK07" was not accepted because the micro-brilliance feeling of aluminum powder was considerably ~~separate~~different from the reference color though the color difference from the reference color was small. In general, when a micro-brilliance-feeling index differs by 2 to 3, it is possible to recognize a difference in the glitter feeling and/or particle feeling of a brilliant material through visual observation.

Please replace the paragraph beginning at page 25, line 9 with the following rewritten paragraph:

Therefore, a corrected blend was obtained by reading the color-measurement data of the color-matched painted plate and performing fine color-matching calculation by the "Van-Van FA station" and a computer. The corrected blend based on the "SM001CK01" was a blend obtained by adding ~~a~~ full-color paints shown in Table 6 below to the paint blends shown in Table 2. In the

a20 cont'd

case of the "SM-001CK07", it was impossible to calculate a corrected blend because the color difference was small, codes of ΔL^* of 25° and 75° were inverted, and the color difference was not attenuated even after the corrected-blend calculation in fine color-matching was performed.

Please replace the paragraph beginning at page 29, line 22 with the following rewritten paragraph:

a21

The paint color of the color-matched painted plate based on the "RP002CK01" ~~were~~ was not accepted because ~~they were~~ it was slightly ~~separate~~ different from the reference color. However, the micro-brilliance-feeling index showed a value almost equal to that of the reference color and the micro-brilliance feeling of a pearl pigment (brilliant mica powder) serving as a brilliant pearl pigment matched with that of the reference color through visual observation. The paint color of the color-matched painted plate based on the "RP-002CK12" ~~were~~ was not accepted because the micro-brilliance-feeling was considerably ~~separate~~ different from that of the reference color though the color difference from the reference color was small.

Please replace the paragraph beginning at page 30, line 2 with the following rewritten paragraph:

a22

Therefore, a corrected blend was obtained by reading color-measurement data of the color-matched painted plate and performing fine colorimetric calculation by the "Van-Van FA station" and a computer. The corrected blend based on the "RP-002CK01" was a blend obtained by adding predetermined amounts of full-color paints shown in Table 13 to the paint blend shown in Table 9. Moreover, in the case of the color-matched painted plate based on the "RP-002CK12", it was impossible to perform a corrected blend calculation for attenuating color differences at three angles in a good balance because the color differences at three angles were too small.

Please replace the paragraph beginning at page 31, line 9 with the following rewritten paragraph:

The micro-brilliance-feeling index of this painted plate showed 26.31. Moreover, because colors and micro-brilliance feeling of the painted plate ~~well~~ matched well with the reference color through visual evaluation, the painted plate was accepted. Therefore, as a result of refinish-painting an automobile body with the actually-color-matched paint and visually performing the color-matching determination for the paint-film surfaces of the refinished paint portion and its vicinity of the automobile body, preferable color-matching was confirmed.

a23

Please replace the paragraph beginning at page 34, line 30 with the following rewritten paragraph:

Paint color of the color-matched painter plate based on the "SM-002CK05" ~~were~~ was not accepted because ~~they were~~ it was slightly ~~separate~~ different from the reference color. However, the micro-brilliance-feeling index showed a value almost equal to that of the reference color and the micro-brilliance feeling of aluminum powder serving as a brilliant material was matched through visual observation. Paint colors of the color-matched painted plate based on the "SM-003CK10" were not accepted because the micro-brilliance feeling of aluminum powder was considerably ~~separate~~different though the color difference from the reference color was small. Generally, when a micro-brilliance-feeling index differs by 2 to 3, it is possible to recognize a difference in glitter feeling and/or particle feeling of a brilliant material through visual observation.

a24

Please replace the paragraph beginning at page 35, line 12 with the following rewritten paragraph:

Therefore, a corrected blend was obtained by reading the color-measurement data of the color-matched painted plate and performing fine color-matching calculation by the "Van-Van FA station". The corrected blend based on the "SM-002CK05" was a blend obtained by adding ~~a~~ full-color paints shown in Table 20 to the paint blend shown in Table 16 by a predetermined quantity. In the case of the "SM-003CK10", it was impossible to perform the corrected-blend

a25

a25
concl calculation of fine color-matching for attenuating a color difference at a preferable balance for three angles because the color difference between three angles was too small.